SECTION 011100

SUMMARY OF WORK

PART 1 – GENERAL

101. GENERAL EXTENT

101.1 CONTRACTOR shall be responsible to execute a complete turn-key project for the GGS wet FGD retrofit, including all phases of engineering, detailed design, procurement, manufacture, fabrication, shop testing, inspection and packaging, delivery, storage and handling, construction, construction planning, controlling, maintenance access, supply and fabrication of materials, receiving, unloading, loading, storage of all materials (including reloading as required), materials control, quality control, QA/QC warranty replacement and installation, demolition, spoils removal, relocation, installation, equipment setting, aligning, leveling, field adjustments, calibration, grouting, commissioning, startup and initial operation, equipment and system testing, training of operations and maintenance personnel, and placement of equipment and systems into successful operation.

101.2 All supplied equipment shall be utility grade, heavy duty and suitable for the application.

101.3 The following explanations and listings are intended to give a general definition of the scope of the work under this specification and shall not be construed to be an itemized listing of each element of work required. CONTRACTOR shall be responsible for engineering, procurement, and construction of complete facilities, conforming in all respects to the details and requirements of the specification, drawings, and other contract documents, for a complete operational installation meeting all performance requirements as intended by these specifications.

102. SCOPE OF WORK

Major components and systems of the work under these specifications include, but are not limited to, the following:

102.1 Wet Flue Gas Desulfurization System (WFGD)

a. One (1) WFGD absorber tower per unit, including inlet duct and flue gas emergency quench section; absorber recycle pumps, slurry spray headers and nozzles; mist eliminator; integral recycle tank with agitators; oxidation air compressors and oxidation air lances; absorber bleed system; mist eliminator wash system; and emergency quench system.

b. Absorber outlet hood, outlet transition elbow and outlet ductwork to chimney breeching including outlet duct and chimney drain piping to the absorber recycle tank.

c. Absorber inlet and outlet duct expansion joints, including expansion joint condensate drains.

d. Reagent preparation system common to both units, including limestone day silo, gravimetric feeder, ball mill pulverizer, mill product tank, mill product transfer pumps, limestone classification system, particle size analyzer, covered limestone slurry storage tanks, reagent feed pumps and all interconnecting piping.

e. WFGD waste gypsum dewatering system common to both units, including hydroclone feed tanks and agitators, hydroclone feed pumps, hydroclones, belt filters, vacuum pumps, filtrate receiver vessels, filtrate pumps, reclaim water tanks and all interconnecting piping.

f. Flush water delivery and drain system for evacuating solids from piping, pumps, and valves.

g. Miscellaneous process tanks (including agitators) and pumps where required.

h. Sump pumps, sump agitators and all associated accessories.

i. Maintenance tank (one common to both units) with all associated pumps, agitators, piping and components.

102.2 Chimney

a. Concrete chimney shell.

b. FRP chimney liner and breeching ductwork including perimeter closure between the ductwork and concrete shell.

c. FRP condensate gutters and associated drain piping

d. Gas tight hinged FRP breeching access door.

e. Minimum of two chimney roof deck drains and associated piping.

f. All structures and foundations required for on-site FRP fabrication including site preparation and grading. CONTRACTOR shall remove/dispose of the foundations installed for the FRP fabrication and restore site to original pre-work condition.

g. Expansion joints for joining sections of the FRP liner, as determined by CONTRACTOR.

h. Liner insulation as required.

i. Access and maintenance platforms including steel framing, handrail, guard plate, grating, self-closing swing gates.

j. Interior and exterior ladders with ladder safety devices. The exterior ladder shall have a ladder cage. The interior ladder from the CEMS platform to the roof shall be staggered with intermediate step-off platforms.

k. Special service elevator, including all required appurtenances, testing and operating permits.

l. The chimney liner shall be equipped with FRP ports located approximately 48" above the grating at the CEMS port level. The following ports and associated equipment are required:

l1. Four (4) EPA RATA Sampling ports.

l2. Two (2) flow monitor ports.

l3. One (1) CEMS port for SO_2, NO_x, CO, CO_2.

l4. One (1) mercury port.

l5. One (1) oxygen port.

l6. Two (2) particulate matter (PM) ports.

l7. One (1) HCL port.

l8. Three (3) spare ports.

l9. Nine (9) swing-in doors mounted in the chimney shell for test probes. Doors shall be 3'-0 x 3'-0.

l10. One (1) 1000 lb capacity material hoist with jib crane located above the CEMS platform for lifting test probes and other equipment. The hoist winch shall be located at grade.

m. Three (3) port enclosures. The scope of work for the enclosures shall include metal siding roof and walls, checkered plate floor, doors, HVAC and lighting.

n. Two (2) two inch diameter 316L stainless steel instrument air lines between CEMS platform and the chimney base. CONTRACTOR shall provide ball valves at each end of each line at the chimney base and at the CEMS platform with a drain at the chimney base.

o. One (1) twelve inch ladder type cable tray, two (2) four inch diameter conduits, three (3) three inch diameter conduits, and one (1) one inch diameter conduit for DISTRICT's CEMS umbilical, tubing and lines from grade to the CEMS platform.

p. Temporary and permanent aviation obstruction lighting and other lighting systems. Aviation obstruction lights shall be mounted on swing-in doors in the chimney shell.

q. Four (4) convenience outlets shall be provided at each platform elevation. One (1) welding receptacle shall be provided at the base of the stack near the elevator and one (1) at each platform level. Two (2) 208 VAC/30 amp power receptacles shall be provided at each work level.

r. Four (4) two inch diameter spare electrical conduits routed between the CEMS level and the base of the chimney with junction boxes at every platform for DISTRICT's future use.

s. Access doors and embedded door frames.

t. External concrete protective coating from CEMS level to top of chimney (Zone A) including the concrete roof deck.

u. CONTRACTOR shall ensure the design of the chimney shell, liner, concrete roof deck, and drains are such that the possibility of falling ice is kept to a minimum to the extent practical.

v. Penetrations through concrete chimney shell for any required utility routings. Penetrations shall be sealed to a water tight condition.

102.3 Limestone Handling

a. Limestone rail car thawing & unloading

a1. Thawing/heating system

a2. Overhead car shaker

b. Limestone rail car unloader

b1. Two (2) steel track hoppers with grizzlies

b2. One (1) variable rate belt feeder (LHBF-1)

b3. Two (2) frozen limestone lump crackers

c. Limestone stack out

c1. One (1) heated and enclosed conveyor (LH-1) with belt scale

c2. Drop spout to grade (telescopic chute), no dust control.

c3. 37 day active pile and 328 day inactive pile.

c4. Bulldozer for moving limestone

d. Limestone reclaim

d1. Two (2) steel reclaim hoppers with grizzlies

d2. Two (2) variable rate belt feeders (LHBF-2 and LHBF-3).

d3. Two (2) frozen limestone lump crackers

d4. Two (2) heated and enclosed conveyors (LH-2A and LH-2B)

d5. Two (2) lime silo feed reversible conveyors (LH-3A and LH-3B)

d6. Magnetic separators at head end of conveyors LH-2A and LH-2B

d7. Bin vent filters on limestone day silos

e. Fogging type dust suppression system

e1. Around track receiving hopper

e2. At discharge of belt feeders and at load zone of receiving belt conveyors

e3. At limestone transfer points

f. Manually operated hopper pin gates for all hoppers

g. Manually operated material level control gates for all belt feeders

h. Sump pits, sump pumps, and sump agitators for unloading and reclaim pits

102.4 Gypsum Handling

a. Two (2) gypsum collecting conveyors (GH-1A and GH-1B)

b. Motorized diverter gates.

c. Two (2) heated and enclosed stack out conveyors (GH-2A and GH-2B)

d. Two (2) drop spouts to grade (telescopic chute), no dust control.

e. 60 hr. normal stack out pile and 60 hr. emergency stack out pile.

102.5 Induced Draft (ID) Booster Fans

a. Two (2) axial flow induced draft booster fans with main motor drives for Unit 1 and two (2) axial flow induced draft booster fans with main motor drives for Unit 2.

b. One (1) lubrication oil skid for each fan.

c. One (1) hydraulic control oil skid for each fan.

d. One (1) seal air system for each fan including interconnecting air duct between seal air fan outlet terminal connections and fan housing terminal connections.

e. All shop and field mounted instruments, gauges, indicators, and taps required for monitoring and control of the fans and auxiliary equipment.

f. Vibration monitoring equipment.

g. Stall warning system for each fan.

h. Hardware and fittings to bypass the bearings and blade pitch control mechanism during flushing.

i. Eight (8) spare filters for each lubricating and hydraulic oil system including gaskets and other related installation hardware for use during start-up flushing.

j. One (1) spare set of fan blades.

102.6 Continuous Emissions Monitoring System (CEMS)

a. CONTRACTOR shall design, manufacture, furnish and install a stack CEMS and a continuous opacity monitoring system for each unit, including all necessary equipment and appurtenances as hereinafter specified for complete and operable systems, fully tested on-site, certified and documented per all applicable United States Environmental Protection Agency (USEPA), State of Nebraska and other local regulations and guidelines to allow start-up and commercial operation of the facility.

b. The CEMS shall be installed at each unit's stack to continuously monitor and analyze plant emissions in compliance with all the requirements promulgated by the USEPA in 40 CFR 60, Appendices A, B, and F, 40 CFR 75 and its applicable appendices, including the latest revisions in effect during the time of shipment, as well as all applicable requirements of state and federal air quality permits.

c. The CEMS shall be a dilution-extractive type system that shall continuously analyze and monitor the volumetric concentration of the stack SO_2, NO_x, CO, CO_2 and Hg, by means of two dilution probes. The stack gas volumetric flow rate shall be measured using ultrasonic flow monitor. The CEMS shall also include a continuous opacity monitoring system for monitoring of optical density of flue gas emissions at the inlet duct of the WFGD.

d. An enclosure for each unit shall be provided to house all equipment for measuring stack SO_2, NO_x, CO, CO_2 and Hg.

e. A dilution-extractive SO_2 monitoring system including all necessary probes, analyzers and enclosures shall be provided at the inlet duct of the WFGD.

102.7 Distributed Control System (DCS)

a. The DCS shall be a Honeywell Experion DCS designed to control, monitor, and protect the Units 1 and 2 wet FGD, limestone handling, gypsum handling, ID booster fans, and all other associated balance of plant equipment and systems provided by CONTRACTOR.

b. The DCS shall perform all control, monitoring, trending, reporting, alarming, and interface functions as described in these Specifications which set forth the minimum requirements for the design,

materials, fabrication, inspection, and testing of the DCS. CONTRACTOR shall be responsible for integrating all DCS components and subsystems into a complete and operable DCS as well as the system configuration including logic, database, trending, logging, historical data collection and graphic programming, testing, documentation, delivery, and field support of installation and startup.

c. CONTRACTOR shall also revise existing furnace draft control and burner management system, as required, for the addition of CONTRACTOR furnished equipment and systems. The revised furnace draft control and burner management systems shall meet the NFPA 85 requirements.

d. CONTRACTOR shall prepare all factory test procedures and perform all factory testing as required by this Specification.

102.8 Civil, Structural and Architectural

a. The existing geotechnical investigation report, available topographical survey data and buried utilities drawings for the Project Site are included as references for use in Section I – Drawing and Data Requirements. CONTRACTOR may perform additional subsurface investigation and topographical survey, if required to complete the Work at no additional cost to DISTRICT.

b. Prepare, file, and obtain necessary storm water discharge permit(s) from the Nebraska Department of Environmental Quality and any other applicable state or local authorities.

c. Develop and maintain a Stormwater Pollution Prevention Plan (SWPPP) throughout the duration of construction.

d. CONTRACTOR shall obtain all building permits required for the Work. CONTRACTOR shall coordinate this activity with DISTRICT. CONTRACTOR shall prepare and issue a permit plan that includes application dates.

e. Civil:

e1. Site preparation, including clearing, grubbing, cut and fill, stockpiling of excess excavated material, off site disposal of waste in a legal landfill, and initial and final grading within the Work areas.

e2. All surveying work necessary to complete the Work and to develop final as-built drawings.

e3. New underground utilities including storm sewer, process water sewer, oily water sewer and sanitary sewer.

e4. New oil/water collection systems at all areas with potential to have oil contaminated water with appropriate containment and an underground drainage system to new oil/water separators as required. Oil/water separator discharge shall be tied into the plant stormwater drainage system with the addition of lift pumps downstream of the oil/water separator, if required. The final overall system shall be as approved by DISTRICT.

e5. Asphalt roads and area paving.

e6. Crushed stone surfacing and geotextile soil separator as may be required for the material storage areas, general plant areas and construction parking and construction laydown areas associated with CONTRACTOR's overall arrangement.

e7. Earthwork including excavation, backfill and compaction for all foundations, ponds, ditches, trenches for underground utilities, temporary construction areas (roads, parking lots, laydown areas, drainage facilities, etc.), permanent roads and parking lots.

e8. All earthwork testing shall be performed by an independent, CONTRACTOR hired and DISTRICT approved Independent Testing Agency.

e9. Temporary and permanent erosion control facilities prior to and during construction. Maintenance shall be provided through construction and temporary measures shall be removed after construction, once the site has been stabilized.

e10. Shoring and temporary support of existing foundations and roads during excavation and construction to prevent damage, washout etc., to existing foundations.

e11. Limestone and gypsum runoff pond and any other stormwater control ponds required. (NPPD to confirm if EPC Contractor should perform this work, or if NPPD has preferred contractor they would hire separately)

e12. Repair of roads and areas on site and off site that may have been damaged by CONTRACTOR or its sub-contractors.

e13. Landscaping and fencing as required.

e14. Seeding, fertilizer, and mulch.

f. Structural & Architectural:

f1. Reinforced concrete foundations for buildings (a list major buildings are listed in Article 102.8f5), chimneys, equipment, structures, and miscellaneous items provided under this specification. CONTRACTOR'S foundation work shall include, but is not limited to auger cast piles, pile load tests, concrete/rebar work (equipment pads, curbs, containments, sumps, trenches, embedded utilities, embedments, etc.), foundation waterproofing and vapor barriers.

f2. Reinforced concrete pits, tunnels and miscellaneous slabs required for the Work. This shall include the limestone unloading concrete pit, the conveyor LH-1 concrete tunnel, the limestone reclaim concrete pit, the reclaim conveyor LH-2A/LH-2B concrete tunnel, sumps, trenches, embedded utilities, embedments and miscellaneous items as required for a complete and functioning system.

f3. All concrete anchors and baseplates for building columns, equipment, utility racks, pipe/duct supports, etc.

f4. Grout work for building columns/posts, equipment, utility racks, pipe/duct supports.

f5. Buildings, including, but not limited to:

f5.1 Two (2) absorber buildings, including rack and pinion elevator for each building.

f5.2 One (1) common reagent preparation building.

f5.3 One (1) common gypsum dewatering building.

f5.4 One (1) limestone rail car thaw shed

f5.5 One (1) limestone rail unloading building with electrical equipment control room and drive house.

f5.6 One (1) common Warehouse (if required – NPPD to confirm).

f5.7 One (1) common Bulldozer Storage Building.

f5.8 One (1) common Wastewater Treatment Building.

f6. Building scope of work includes, but limited to: structural steel components, architectural features, floor slabs, walkways, masonry block wall, metal roof deck, metal wall and roof panel, single ply roofing membrane, sheet metal flashing, fireproofing, caulking, sealing and firestopping, doors, windows, ceramic and quarry tile, resilient floor coverings, etc.

f7. All process equipment shall be located inside of the buildings, except for any large field fabricated tanks.

f8. Structural support steel for ductwork, above grade equipment, above grade conveyor systems, pipe and pipe supports, isolated phase bus duct, cable raceway, etc.

f9. All access stairs, platforms, grating, railings, and ladders, including access for testing, inspection and maintenance of all equipment, valves, instruments, components, and systems provided.

f10. Pipe/utility racks between various pieces of equipment and/or buildings and structures in accordance with CONTRACTOR's arrangement; including structural steel, grating platforms, railings, ladders and access stairs.

f11. All lifting beams, monorails, hoists, hoistways, lifting devices, and cranes required for maintenance of all equipment provided.

f12. Flue gas ductwork, dampers, expansion joints, turning vanes, access doors, insulation, lagging and other ductwork accessories between the interface points.

f13. The existing flue gas ductwork between each of the existing ID fans and existing chimneys for both units may be re-used as part of the new ductwork system to the ID booster fans and FGD system. CONTRACTOR shall evaluate the feasibility and cost effectiveness of this option and determine if reinforcement of the ductwork is required. CONTRACTOR's responsibility shall include any reinforcing, removal and demolition of this ductwork. The breeching connections and top of flue in both of the existing chimney shall be capped.

f14. A rail road tracks cross-over walkway at the rail unloading building, 23 ft. clear under the walkway, with stair systems at both ends from walkway to grade.

f15. Coating work consisting of surface preparation, shop coating, field touch-up and field coating for structural steel, equipment, tanks, ductwork, piping and facilities.

f16. Laboratory/office furniture and equipment.

102.9 Mechanical

a. A complete compressed air system to serve all systems provided under these specifications common set of instrument/service air compressors, air receiver tanks, and air dryers as defined in Section 431250 as well as the entire instrument and service air piping system for the FGD buildings. Separate service air and instrument air headers shall be provided. As a minimum, service air hose stations shall be provided in all buildings, conveyors, and material handling loading/unloading areas.

b. A complete new well water system, including well pumps, well pump houses, piping, valves, strainers, devices, instruments, supports, local pump controllers, and other associated equipment. CONTRACTOR shall utilize existing well OW-24 and well pump and wells OW-27 and OW-28. Well test data for wells OW27 and OW-28 is available (See Section I supplements). CONTRACTOR shall perform initial testing of these wells to verify the capacity is the same as shown by the well test data, and if different, shall perform additional well testing.

c. A complete makeup water system (supplied from well water system), including storage tank, pumps piping, valves, strainers, devices, instruments, supports and associated equipment. The makeup water pumps shall be located in the existing bottom ash pump house. CONTRACTOR shall also utilize the existing ash water make-up tank, which is no longer in use, as a redundant storage tank for the makeup water system.

d. A complete service water system fed from the makeup water system, including pumps (if required), piping, valves, strainers, devices, instruments, supports, and other associated equipment. As a minimum, service water hose stations shall be provided in all buildings, conveyors, and material handling loading/unloading areas.

e. A complete drains and sumps system, including pumps, piping, valves, supports, devices, instruments, and other associated equipment.

f. A complete fire protection system including, but not limited to, the following: all spray nozzles, sprinkler heads, heat and smoke detection devices, strainers, OS&Y valves, nonrising stem gate valves with wall post indicator valves, sprinkler and spray system piping, fittings, strainers, fire department connections, pipe hangers and supports, expansion joints, booster fire pumps (if required) valve houses, alarms, controls, local control panels, wiring, conduit, fire detection devices, and instrumentation as required for complete fire protection systems. Each system shall be designed to provide the required protection for the specific hazard. Fire protection systems shall be provided as required by specifications, local and state authorities, and insurance providers.

g. Potable water system requirements for all buildings, systems, and components furnished under these specifications, including tie-in to DISTRICT's potable water system. Each absorber building, the reagent preparation building the gypsum dewatering building, the waste water treatment building and the warehouse shall be equipped with a mono-gender sanitary facility, consisting of a toilet, urinal, wash sink, mirror, and drinking fountain.

h. CONTRACTOR shall replace the existing 1" underground potable water supply line to the bottom ash pump house with a 2" HDPE underground line, and shall confirm that adequate flow and pressure will be provided to the users. (NPPD to confirm if this is what they want)

i. Safety showers and eyewash stations, including water heaters and associated equipment.

j. All building roof drain systems.

k. All heating, ventilation, and air conditioning (HVAC) systems, including engineering, procurement, manufacturing, supply, transportation, site delivery, erection and construction, testing, balancing, commissioning, startup, warranty/guarantee, training for HVAC equipment/systems as indicated in Section 230000.

l. All new above ground and underground process piping in accordance with these specifications, including the supply and fabrication of all piping materials, fittings, valves, piping in-line components, supports, and associated components and materials for complete operational systems.

m. Flue gas ductwork dampers, damper actuators, seal air blower skids (if required), and associated equipment.

n. All field erected tanks and shop fabricated tanks and accessories.

o. Piping and tubing insulation and jacketing, including heat tracing equipment and materials.

p. Perform all testing and non-destructive examinations in accordance with these specifications. This includes the submittal of all applicable code paperwork and quality assurance documents in accordance with ASME and other codes and standards if required, and as indicated in these specifications.

q. Perform all hydrostatic and pneumatic testing of piping systems in accordance with the applicable code requirements, and as specified herein.

r. Perform the flushing and pickling (if required) of the lube oil and hydraulic systems items in accordance with the manufacturer's requirements and these specifications, including the ID fans, air compressors and any other applicable equipment.

s. Perform the sterilization of the potable water system equipment and piping installed under this Contract.

102.10 Electrical, Instrumentation and Controls

a. A complete auxiliary electric system to supply power to all equipment and facilities in this specification as specified herein.

b. Two (2) Unit Auxiliary Transformers (UAT) B-1 & B-2.

c. Two (2) Startup / Reserve Auxiliary Transformer (SRAT) A-1 & A-2.

d. Pre-fabricated, factory assembled Electrical Equipment Buildings including HVAC and containing the following:

d1. Arc resistant medium voltage switchgear.

d2. 480V secondary unit substation transformers, switchgear, and non-segregated phase bus duct.

d3. Motor control centers.

d4. 125VDC battery systems and redundant battery chargers.

d5. Uninterruptible power supply (UPS) system.

d6. DCS cabinet(s).

d7. AC and DC panel boards.

e. Two (2), three phase, isolated phase bus duct assemblies, one (1) for each UAT, complete with all accessories.

f. Cable bus.

g. Medium voltage motors.

h. Low voltage motors.

i. Emergency Diesel Generator consisting of the diesel engine and all engine auxiliary systems, the generator and all auxiliary systems, switchgear, batteries and battery chargers, controls, which is fully enclosed within a pre-fabricated weather-proof enclosure, provided with HVAC, fire protection and indoor/outdoor lighting

j. Lightning protection system.

k. Grounding system.

l. All power, control, instrument, and communication/data/security cables.

m. All cable trays, conduits, and raceways, and their fittings, junction boxes, terminal boxes, support hardware and brackets, etc.

n. Welding receptacles.

o. Interior and exterior lighting systems including fixtures, contactors, light poles, supports, panel boards, transformers, receptacles, emergency lighting, etc.

p. Aviation Obstruction Lighting.

q. Plant communication (public address and telephone) systems.

r. Electric heat tracing and freeze protection including heating cable, connectors, thermostats, wiring panels, and controls.

s. All necessary instrumentation and local control components, including but not limited to control drives, control valves, process transmitters, switches, sensors, instrument sensing lines, manifolds, sample lines, instrument racks and panels that are required for system operation.

102.11 Relocation and Demolition Work

a. Relocate the PM and HCl CEMS from the existing chimneys to the new chimneys.

b. Demolition and relocation of existing underground utilities

c. Demolition and relocation of all existing above ground piping within the work area as required.

d. Demolition and relocation of all existing above ground electrical systems within the work area as required

e. Relocation of existing hydrogen building and transformer oil interceptor to avoid new 230 kV transmission lines.

102.12 Engineering services

a. Attend monthly project design engineering meetings at DISTRICT's office, project site, or CONTRACTOR's offices, as determined by DISTRICT.

b. Prepare and provide for review all engineering design documentation and data, calculations, computer analyses, mass balances, process and system design basis, equipment design basis, data sheets, protective relay settings, drawings, lists, manuals (O&M and training), and documents required for the complete design, construction, startup, operation, and maintenance of all systems provided, stamped and certified by professional engineers licensed in the state of Nebraska.

c. Develop and maintain a computerized 3D model of equipment, piping, valves, supports, cable tray, steel, stairs, walkways, platforms, and all components to adequately perform interference checks, do model "walk-throughs" with DISTRICT, and to perform CONTRACTOR's layout and routing design work.

d. Develop and submit engineering-procurement-construction schedules and monthly progress reports.

e. Prepare and submit for review engineering specifications and data sheets as needed for the design, procurement, and construction of all equipment and materials.

f. Develop and submit for review inspection and test plans (ITPs) for all engineered equipment and material provided by contract.

g. Assist DISTRICT in the acquisition or adjustments of emissions permits required in the regulatory approval of the systems by provided requested specific information for specific design, operating, and other plant criteria as necessary.

h. Conduct and submit for review flow model tests for both units' entire flue gas systems between interface points and prepare test reports. Flow model shall include all equipment in the gas flow path including ductwork, dampers, fans, absorber modules, and lower portion of chimney. Modeling shall include both physical and computational fluid dynamic (CFD) models of gas flow, temperatures, and droplets at various unit load conditions as specified. Physical flow model testing will be witnessed by DISTRICT.

i. Prepare and submit for review spare parts lists for all equipment and components, complete with recommendations on operational spare parts quantities and pricing.

j. CONTRACTOR shall provide system software upgrades and updates until one (1) year after commercial operation of the plant. The software upgrades shall be made at no expense to DISTRICT. Both the software and the installation services shall be at no charge to DISTRICT

102.13 Construction, Commissioning and Start-up Services

a. Provide all phases of construction and project field management for the construction efforts. Such activities shall be coordinated with all DISTRICT plant operating activities.

b. All required construction equipment, special tools, lifting beams, scaffolding, and both temporary and permanent miscellaneous materials required for the performance of this Contract.

c. Construction trailers, supplies, telephone/internet service, field office furnishings, and equipment for labor force and manufacturer's technical service representatives.

d. Obtain and purchase any other required construction permits not noted above.

e. Coordination of construction activities with DISTRICT and applicable outages for tie-ins.

f. Review existing plant operating and maintenance procedures for any impacts relating to this work and advise DISTRICT accordingly.

g. Provide and implement a field QA/QC program for all construction and testing activities.

h. Provide and implement a safety program.

i. Perform all field testing, inspections and checkouts for all structural, mechanical and electrical equipment/systems.

j. Perform calibration, checkout, and startup responsibilities in accordance with these specifications for all instrumentation and control equipment furnished and/or erected under this contract.

k. Provide the services of qualified equipment manufacturer's technical field services for all major equipment for the functions as specified herein, from initial mobilization through startup and commissioning.

l. Provide training for equipment, materials, components, and systems provided.

m. Conduct noise testing as specified.

n. Performance and reliability testing of all equipment and systems as detailed herein performed by a DISTRICT approved Third Party Testing firm. (Would NPPD prefer to hire third party testing firm separately?)

o. All spare parts required during startup and initial operation of the equipment and systems through startup and commissioning.

p. Construction power system that is connected to DISTRICT furnished power connection points.

q. Temporary construction lighting.

r. First fills of all lubricating oil and greases.

s. Trash collection, removal, and recycling.

t. Construction consumables and temporary materials.

u. Final cleanup.

103. WORK BY OTHERS

103.1 DISTRICT (through separate contracts) will furnish:

a. All required federal, state and local operating and environmental permits, with the exception of CONTRACTOR supplied permits noted in Article 102.

b. Plant personnel for assistance with plant operations during performance and reliability guarantee testing.

c. Addition of the new limestone railroad loop.

d. Selective Catalytic Reduction (SCR) System (if required) including ductwork, reactor, catalysts, sonic horns, sootblowers, urea to ammonia system, and all associated modifications/reinforcements to the existing flue gas path, combustion air systems, and fly ash handling system.

e. Demolition of the Unit 1 and Unit 2 Electrostatic Precipitators (ESP)

f. Activated Carbon Injection (ACI) System

g. 230 kV transmission line work and switchyard work

h. Zero Liquid Discharge (ZLD) System to treat the WFGD wastewater blowdown streams.

i. Modifications to the existing fly ash damp unloading system to receive all or a portion of the WFGD blowdown stream.

j. PM and HCl CEMS. They will be furnished by DISTRICT and shall be relocated and installed by CONTRACTOR.

k. Provide fuel and water for field testing activities.

104. TERMINAL POINTS

104.1 The terminal points listed in Table 1-1 are provided to define interface locations and connection parameters with equipment supplied by others. Lack of reference to a specific terminal point does not relieve CONTRACTOR from providing the required interface for all such terminal points. CONTRACTOR shall provide interfacing design information at each terminal point.

TABLE 1-1
TERMINAL POINTS

Item/Description	INTERFACE POINT	COMMENTS
Existing Induced Draft (ID) Fans	Outlet connections at each of the Unit 1 and 2 ID fans.	1. Existing ductwork connecting to the existing chimneys shall be removed and demolished by CONTRACTOR.
Fire Protection System	Connection(s) to the existing plant fire protection underground loop.	1. CONTRACTOR to determine most appropriate tie-in location(s) upon approval from DISTRICT.
Fire Protection System	Connections to the existing main fire alarm control panel	2. CONTRACTOR to evaluate if adequate spares are available in existing panel or if additional terminals need to be added.
Potable Water System	Connection(s) to the existing plant potable water system.	1. CONTRACTOR to determine most appropriate tie-in location(s) upon approval from DISTRICT.
Instrument Air System	Connection(s) to the existing plant instrument air system.	1. CONTRACTOR to determine most appropriate tie-in location(s) upon approval from DISTRICT.
Service Air System	Connection(s) to the existing plant service air system.	1. CONTRACTOR to determine most appropriate tie-in location(s) upon approval from DISTRICT.
WFGD waste water blowdown stream	Piping terminations to be located within each absorber building	
Sanitary Sewer System	Connection(s) to the existing plant sanitary sewer system.	1. CONTRACTOR to determine most appropriate tie-in location(s) upon approval from DISTRICT.

Item/Description	INTERFACE POINT	COMMENTS
Storm Water Sewer System	Connection(s) to the existing plant storm water sewer system.	1. CONTRACTOR to determine most appropriate tie-in location(s) upon approval from DISTRICT.
Oily Water Waste System	Connection(s) to the existing plant oily water waste system.	1. CONTRACTOR to determine most appropriate tie-in location(s) upon approval from DISTRICT.
Limestone rail thaw shed	Rail road inlet to thaw shed	
Limestone rail unloading building	Rail road outlet at unloading building	
Auxiliary power system	High end bushings of each UAT and SRAT	

105. DESIGN AND REFERENCE DRAWINGS

105.1 Reference drawings provided with this specification, as well as the requirements for CONTRACTOR supplied drawings, documents and data are defined in Section I – Contract Drawing and Data Requirements.

106. PACKAGING AND SHIPPING

106.1 Packaging and shipping of equipment and materials shall be in accordance with Section F – General Conditions.

107. HAZARDOUS MATERIALS

107.1 As required under Federal Hazardous Communications Standards and applicable state and local laws, CONTRACTOR shall provide Material Safety Data Sheets covering all hazardous materials furnished under or otherwise associated with the work under this Contract in accordance with DISTRICT's General Requirements, or CONTRACTOR shall certify in writing that no Material Safety Data Sheets are required under any federal, state, or local law, regulation, statute or ordinance in effect at the jobsite. CONTRACTOR shall identify those hazardous materials that remain on the jobsite at the end of the Project.

END OF SECTION 011100